

## **CHAPTER II**

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### **RESULTS OF THE STUDY**

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In its study of 85 regulatory impact analyses, the Congressional Budget Office focused on three principal indicators of the effort involved in preparing RIAs: dollar costs, time, and number of permanent staff members devoted to that work. Other measures are possible in some cases, but those are the ones most consistently available for quantitative analysis comparing agencies. All three indicators showed wide variations.

### **COSTS VARY CONSIDERABLY**

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The 85 RIAs that CBO reviewed exhibited a broad range of costs, both within and among agencies. Overall, the average cost per analysis was about \$573,000, with a median of \$271,000 (see Table 2).<sup>1</sup> Individual RIAs cost anywhere from \$14,000 to more than \$6 million. The average cost per analysis at each agency also ran the

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1. The cost data are skewed upward because a relatively small number of observations have very high values, while the bulk of the observations have a much lower value. Thus, the median—the halfway point of the values—is smaller than the average. The standard deviation of a highly skewed distribution is also large, about \$960,000 in this case. The influence of the expensive cases can be shown by removing the four observations with costs above \$2 million and recalculating the statistics. For the remaining 81 observations, the average value drops considerably, to about \$390,000; the median drops slightly, to about \$270,000; and the standard deviation falls to about \$330,000, less than one-third of its previous value. Neither set of statistics is "right" or "wrong." In this sample, a few very expensive cases have a substantial effect on the overall results and contribute heavily to the variability between cases. The four most expensive studies came from EPA—two each from the Office of Air and Radiation and the Office of Solid Waste.

TABLE 2. OVERVIEW OF 85 REGULATORY IMPACT ANALYSES BY FOUR AGENCIES

Agency	Number of RIAs	Staff FTEs per RIA	Contract Cost per RIA (In thousands of 1995 dollars)	Duration of RIA	Cost (In thousands of 1995 dollars)		
					Average	Median	Total Range
Environmental Protection Agency							
Office of Air and Radiation	25	0.1 to 37.0	0 to 2,590	9 months to 12 years	683	259	55 to 4,871
Office of Solid Waste	17	0.2 to 7.5	78 to 5,397	4 months to 9.75 years	989	554	87 to 6,097
Office of Water	23	0.1 to 2.8	26 to 824	1 year to 7 years	396	230	48 to 1,054
Subtotal	65	0.1 to 37.0	0 to 5,397	4 months to 12 years	662	376	48 to 6,097
National Highway Traffic Safety Administration	7	0.1 to 3.75	None	6 weeks to 9 months	112	57	14 to 429
Federal Aviation Administration	6	1.0 to 5.5	89 to 110 <sup>a</sup>	7 months to 1 year	245	251	118 to 458
Coast Guard	7	0.1 to 5.0	155 to 818	1 year to 6 years	497	361	183 to 1,387
Total	85	0.1 to 37.0	0 to 5,396	6 weeks to 12 years	573	271	14 to 6,097
Memorandum:							
Occupational Safety and Health Administration	21	6.4	420 <sup>b</sup>	5 years	1,000 <sup>b</sup>	N.A.	15 to 3,500 <sup>b</sup>

SOURCE: Congressional Budget Office.

NOTE: RIA = regulatory impact analysis; FTE = full-time equivalent; N.A. = not available.

a. The FAA uses one in-house contractor.

b. Costs in thousands of nominal dollars.

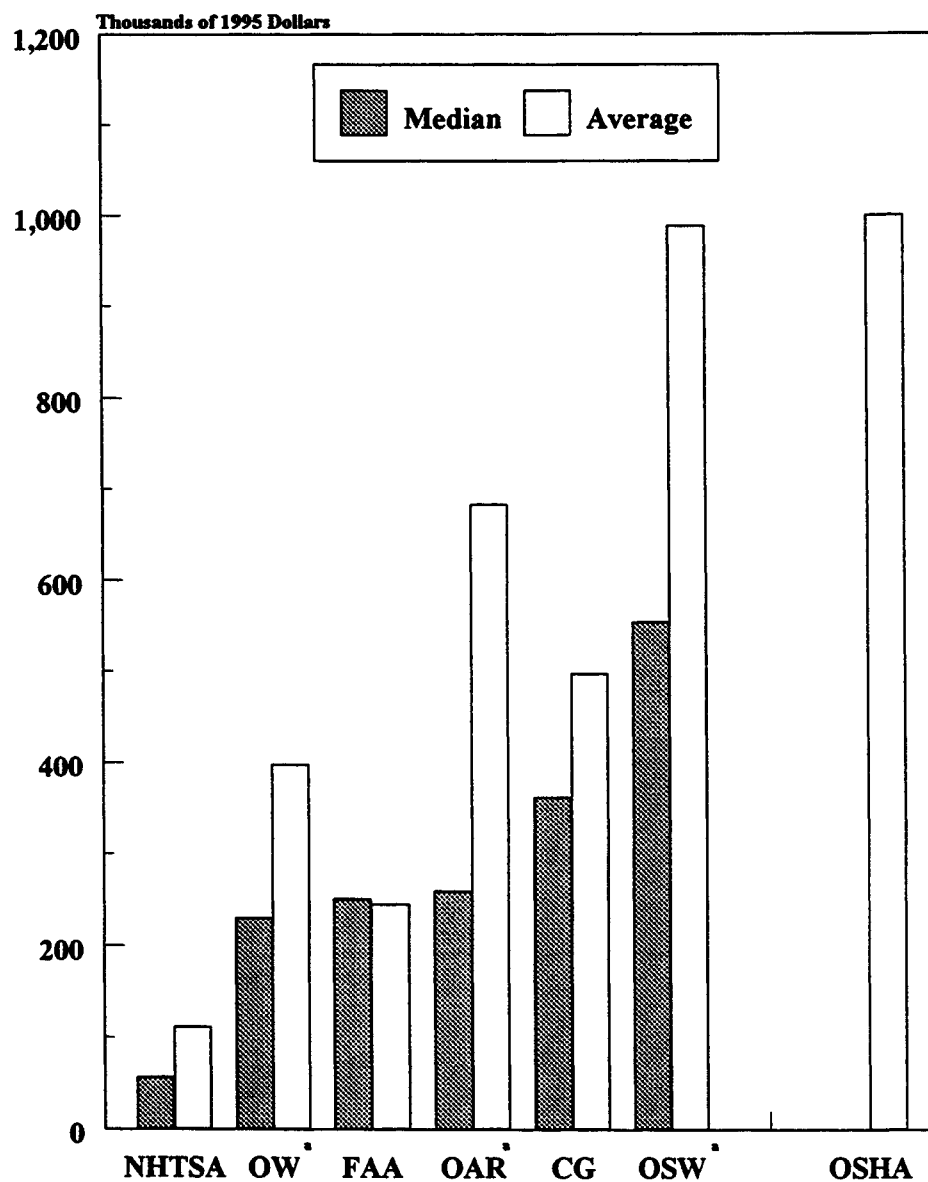
gamut—from \$112,000 to \$989,000 (see Figure 1). Median costs by agency ranged from \$57,000 to \$554,000. Chapter III examines why costs varied so widely.

The agencies with the least expensive RIAs were the National Highway Traffic Safety Administration (an average of \$112,000 and a median of \$57,000), and the Federal Aviation Administration (an average of \$245,000 and a median of \$251,000). The seven analyses performed by the NHTSA ranged in cost from \$14,000 to \$429,000 (see Figure 2). The FAA's six RIAs varied from \$118,000 to \$458,000. At both agencies, staff members rather than contractors performed most of the analyses, and because agencies do not keep time sheets, the costs of agency personnel are somewhat uncertain. Also, the NHTSA and the FAA analyzed relatively few “significant” rules—only about one per year.

All of the other offices included in CBO's study had wider (and higher) ranges of costs. The Coast Guard, for example, spent between \$183,000 and \$1.4 million per RIA, with an average of about \$500,000 and a median cost of \$361,000. Farther up the scale, the Occupational Safety and Health Administration estimated that it spent an average of \$1 million for each regulatory analysis, with actual costs ranging from \$150,000 to \$3.5 million per analysis.

Even within a single agency, costs can vary substantially among offices and program areas. At the Environmental Protection Agency, the Office of Water spent

FIGURE 1. MEDIAN AND AVERAGE COSTS OF REGULATORY IMPACT ANALYSES, 1988-1996

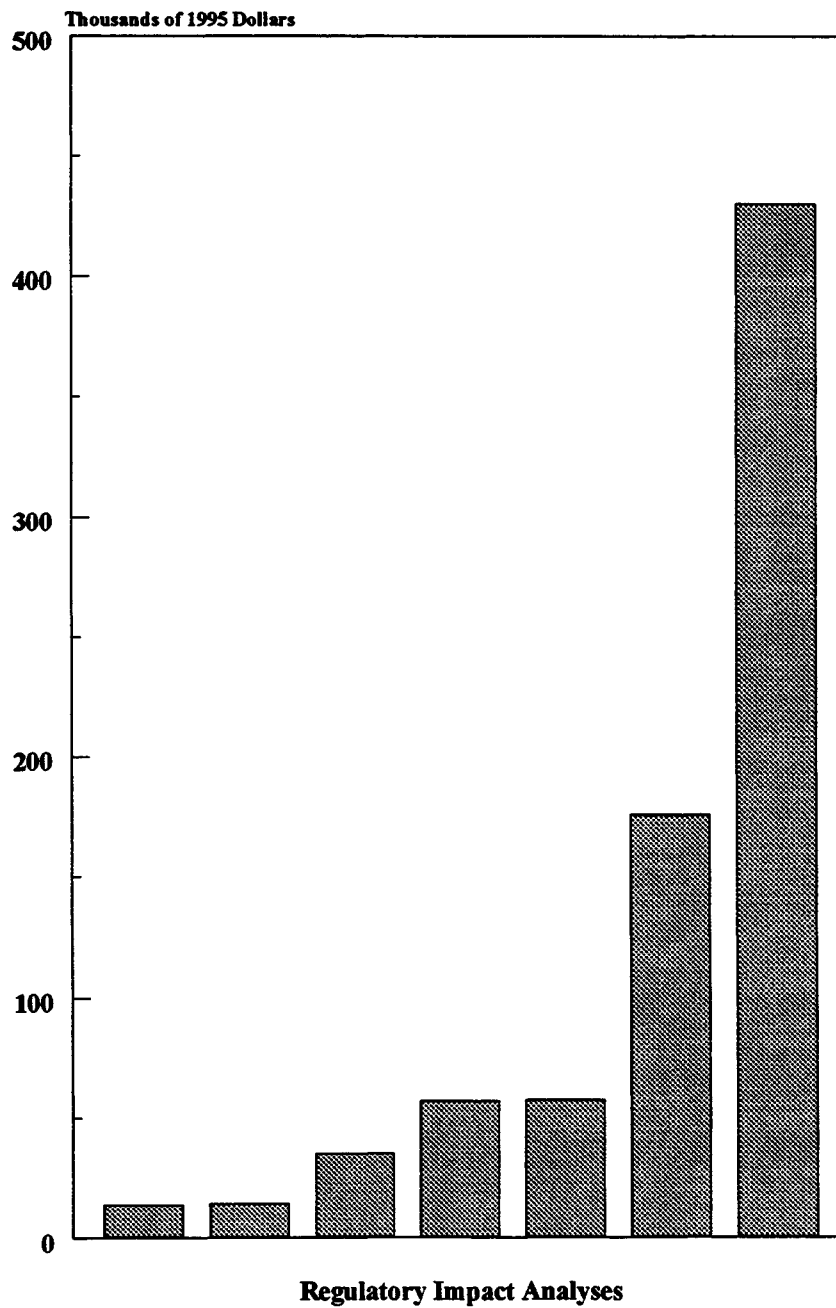


SOURCE: Congressional Budget Office using data from the agencies cited.

NOTE: NHTSA = National Highway Traffic Safety Administration; OW = Office of Water; FAA = Federal Aviation Administration; OAR = Office of Air and Radiation; CG = Coast Guard; OSW = Office of Solid Waste; OSHA = Occupational Safety and Health Administration.

a. An Office of the Environmental protection Agency

FIGURE 2. COSTS OF SEVEN REGULATORY IMPACT ANALYSES CONDUCTED BY THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION, 1992-1995



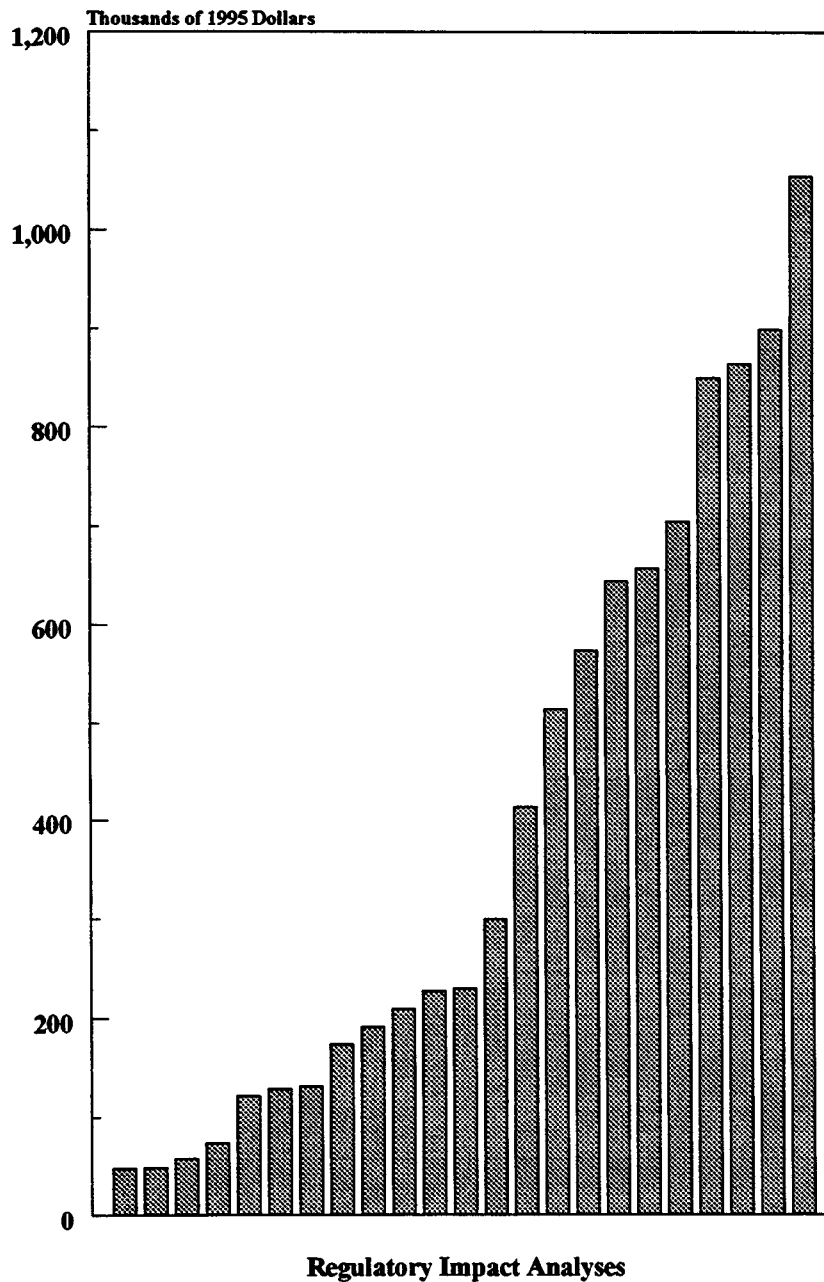
SOURCE: Congressional Budget Office using data from the National Highway Traffic Safety Administration.

\$48,000 to about \$1.1 million apiece for 23 analyses, with an average cost of \$396,000 and a median of \$230,000 (see Figure 3). The Office of Air and Radiation spent between \$55,000 and \$4.9 million per analysis, with an average of \$683,000 and a median of \$259,000 (see Figure 4). The Office of Solid Waste showed an even wider range. Its cost per RIA varied from \$87,000 to about \$6.1 million, with an average of \$989,000 and a median of \$554,000 (see Figure 5).

The \$6.1 million analysis in the Office of Solid Waste is a special case with a long history. It illustrates some of the reasons why costs for analysis can vary considerably from regulation to regulation. That RIA was conducted for the rule on "Corrective Action for Solid Waste Management Units." The corrective action program applies to more than 5,000 facilities in the United States that treat, store, or dispose of hazardous waste. The facilities subject to corrective action are generally still operating (as opposed to Superfund sites, which are usually closed or abandoned). The corrective action program directs owners and operators to clean up their sites to acceptable standards so as to prevent future Superfund sites from occurring. Because all of the sites have different contamination problems, estimating the cost of cleanups is very difficult and expensive. Cleaning up the sites is also quite costly, running to billions of dollars each year.

According to EPA, the RIA for corrective action is one of the most highly developed analyses the agency has ever conducted. Although EPA had already

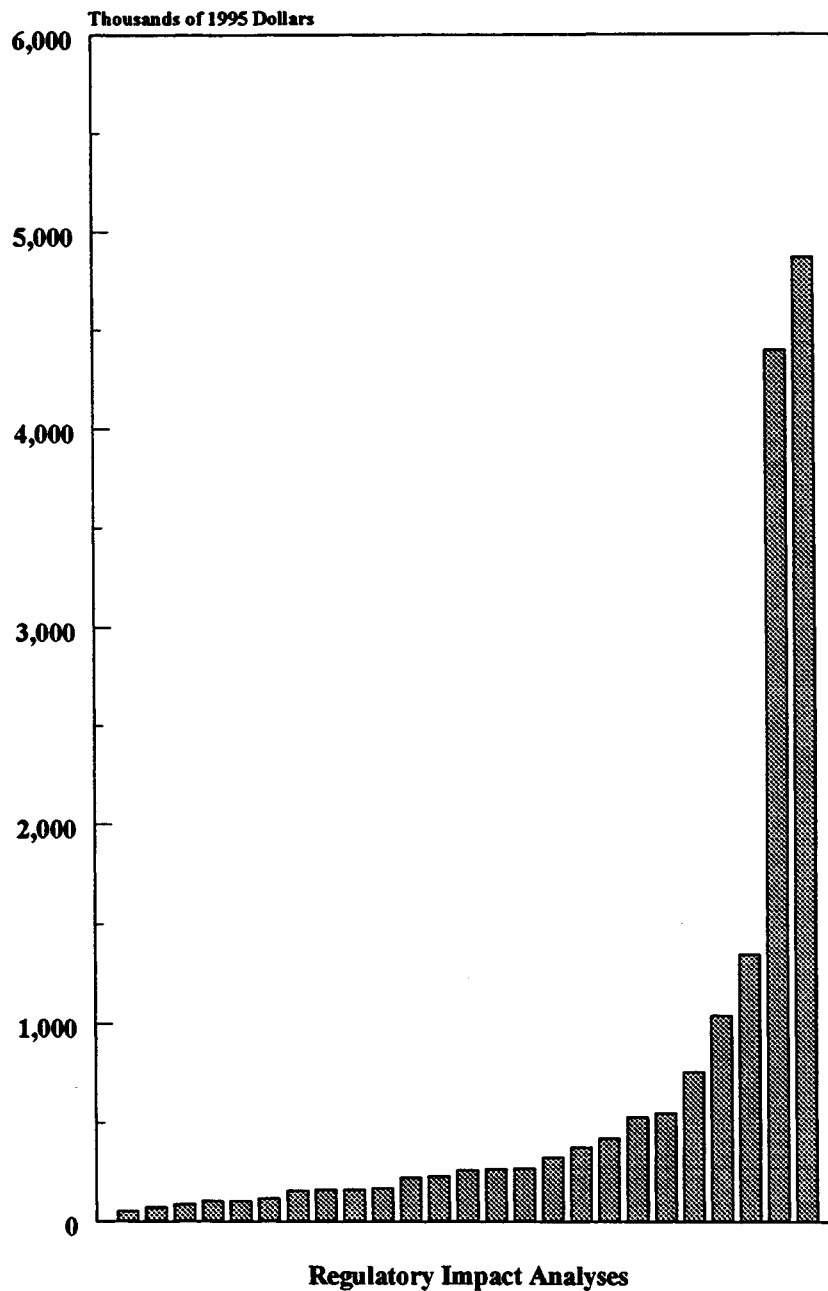
FIGURE 3. COSTS OF 23 REGULATORY IMPACT ANALYSES CONDUCTED BY THE OFFICE OF WATER, ENVIRONMENTAL PROTECTION AGENCY, 1990-1996



SOURCE: Congressional Budget Office using data from the Environmental Protection Agency.

NOTE: Costs are for agency personnel (full-time equivalents) and contractors.

FIGURE 4. COSTS OF 25 REGULATORY IMPACT ANALYSES CONDUCTED BY THE OFFICE OF AIR AND RADIATION, ENVIRONMENTAL PROTECTION AGENCY, 1990-1996

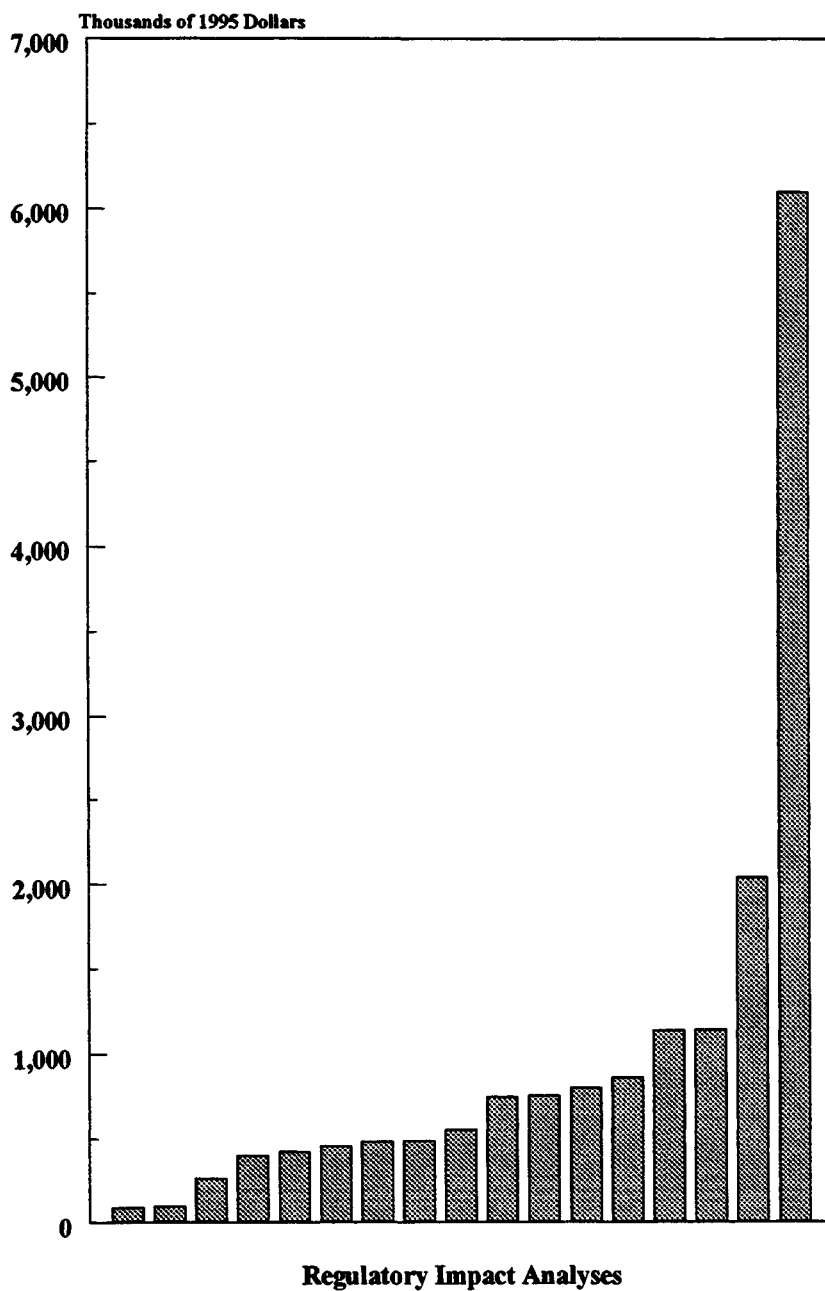


SOURCE: Congressional Budget Office using data from the Environmental Protection Agency.

NOTE: Costs are for agency personnel (full-time equivalents) and contractors.



FIGURE 5. COSTS OF 17 REGULATORY IMPACT ANALYSES CONDUCTED BY THE OFFICE OF SOLID WASTE, ENVIRONMENTAL PROTECTION AGENCY, 1990-1996



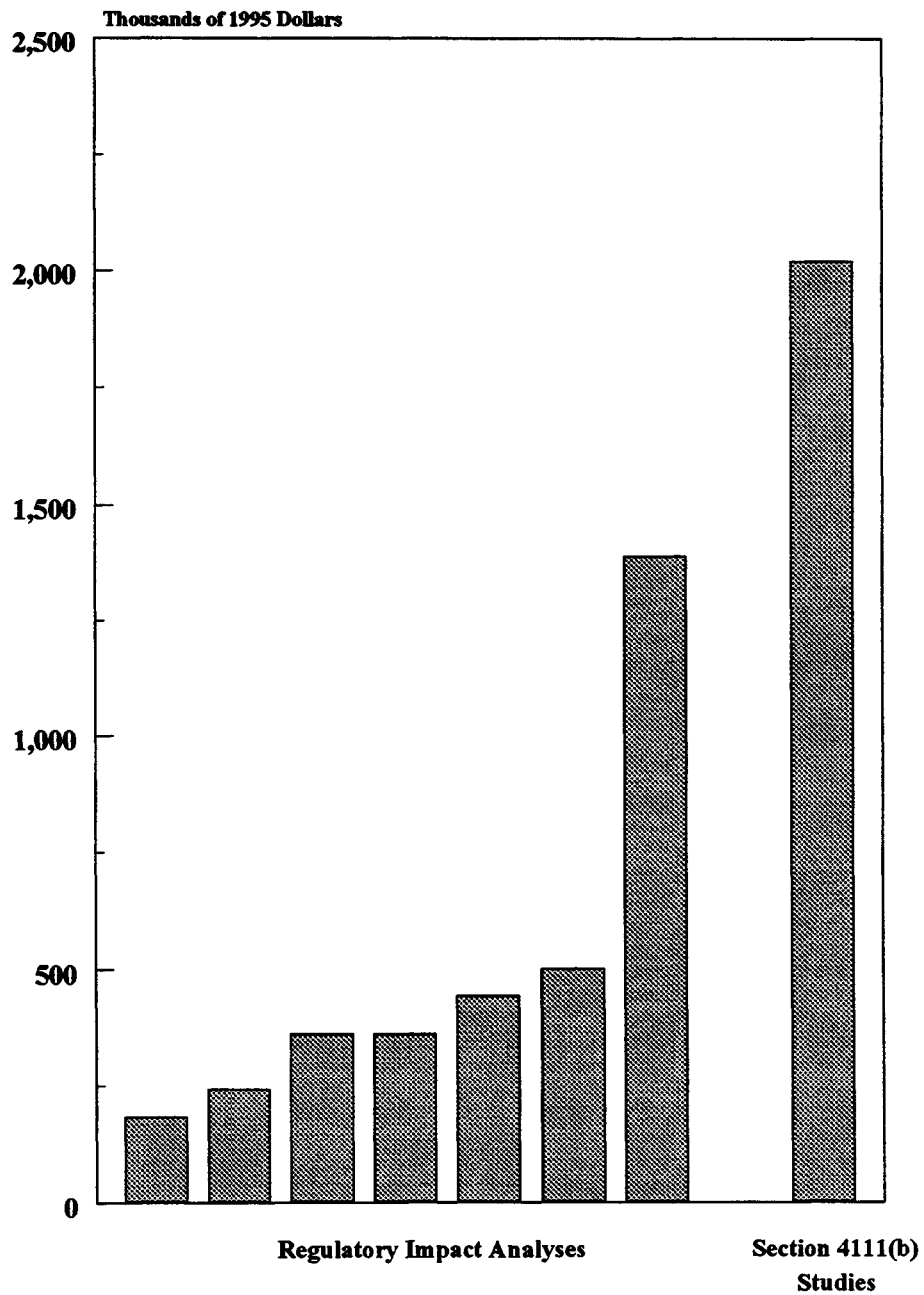
SOURCE: Congressional Budget Office using data from the Environmental Protection Agency.

NOTE: Costs are for agency personnel (full-time equivalents) and contractors.

completed a cost-benefit analysis of the corrective action program that was published in 1990 (at an estimated cost of about \$754,000 in 1995 dollars), the Office of Management and Budget made its approval of the rule contingent on a more extensive cost-benefit analysis. As a result, EPA convened national panels of experts for several weeks at a time and conducted in-depth studies of about 80 facilities. It also conducted several types of analyses, including property valuations (both for residences near the facilities and for the facilities themselves) and a valuation of the hypothetical environmental benefits of cleanup (based on surveys). Work on the RIA for corrective action is still going on.

Although regulatory impact analyses represent a significant cost to most agencies, they are not always the most expensive type of analysis the agencies perform. For example, section 4111(b) of the Oil Pollution Act of 1990, passed in the wake of the Exxon Valdez accident, mandated that the Coast Guard conduct studies of tanker safety. One set of such studies covered 12 topics, including the adequacy of training for tanker crews, the adequacy of inspection standards, tanker crews' ability to clean up oil spills, and other tanker-related safety issues. That set of studies cost an estimated \$2 million in all, more than any RIA produced by the Coast Guard (see Figure 6).

FIGURE 6. COSTS OF REGULATORY IMPACT ANALYSES AND SECTION 4111(b) STUDIES CONDUCTED BY THE COAST GUARD, 1990-1996



SOURCE: Congressional Budget Office using data from the Coast Guard.

NOTE: Costs are for agency personnel (full-time equivalents) and contractors. Section 4111(b) of the Oil Pollution Act of 1990 mandated that the Coast Guard conduct studies of tanker safety.

### Distinguishing Personnel Costs from Contractor Costs

The costs of performing regulatory impact analyses are generally incurred as contractor costs, staff time, or both. Of the five agencies in CBO's study, EPA, OSHA, and the Coast Guard use outside contractors regularly. All of the agencies stressed that estimates of the staff time they expend on RIAs are uncertain because they do not keep time sheets. Instead, the estimates they provided to CBO, which are expressed in staff full-time equivalents (FTEs), depend largely on the recollection of the RIA manager (assuming that person still works at the agency).

The cost in terms of agency personnel varied considerably among the analyses. The average RIA required 2.2 staff FTEs to complete (the median was half that), although individual analyses ranged from 0.04 FTEs to more than 37. The two multimillion-dollar RIAs by the Office of Air and Radiation also consumed an unusually large number of staff—25 and 37 FTEs. Average personnel figures by agency showed a much narrower range, from one FTE per analysis at the NHTSA to more than four at EPA's Office of Air and Radiation. Only five of the 85 RIAs in CBO's sample took more than five FTEs.

Contracting costs varied as much as FTE costs, from none at the NHTSA (which uses no contractors) to more than \$5 million for one analysis at EPA's Office of Solid Waste (see Table 2 on page 14). Average contract costs per RIA at the

offices that used outside contractors—the Coast Guard and all EPA offices—were about \$420,000, with a median of \$230,000. The FAA used one in-house contractor, who works at the agency, at a nominal cost of \$85,000 per year. Table 2 displays the 1995 value of this amount. (OSHA, which was not officially part of CBO's study, reported that it spent an estimated \$420,000 per RIA on contractors.)<sup>2</sup> The Coast Guard's contract costs ranged from \$155,000 to \$818,000 per analysis. At the Environmental Protection Agency, contract costs in the Office of Air and Radiation ranged from zero to \$2.6 million per RIA; in the Office of Water, from \$26,000 to \$824,000; and in the Office of Solid Waste, from \$78,000 to about \$5.4 million. (Overall, only three of the 85 RIAs that CBO surveyed had estimated contract costs over \$1 million.) For most of those offices, contract costs accounted for 75 percent to 84 percent of total RIA costs. An exception was the Office of Water, where contract costs made up less than half of the total.

### Three Caveats About Costs

Although CBO has made its best effort to present a valid picture of agencies' costs for preparing RIAs, the primary data contain some intrinsic ambiguities that should be acknowledged. Those fall into three categories: lack of cost information broken

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2. OSHA's costs are in nominal dollar values since CBO could not separate individual expenditures by year. All other costs are stated in 1995 dollars.

down by RIA, instances in which the costs of other data or analytic activities were included in the cost reported for an RIA, and instances in which the costs of data or analysis that is needed for the RIA were not included.

Costs Are Not Broken Down by RIA. Agencies do not track costs separately for regulatory impact analyses or any other project. Instead, agencies track contractor costs through contracts—each of which may contain several projects—and through contractors' bills to the agency. As mentioned above, they generally do not keep time sheets for tracking staff time. Thus, agencies had trouble responding to CBO's request for the personnel time and contract costs of each RIA. To provide the data, agencies had to interview people who worked on the RIA and trace the costs through various annual contracts. In general, their estimates of staff time are less reliable than their estimates of contracting costs.

A case from EPA's Office of Water illustrates the difficulty of allocating costs when several projects are managed under the same contract. Three ongoing analyses—for the Disinfectants/Disinfection Byproducts Rule, the Interim Enhanced Surface Water Treatment Rule, and the Information Collection Rule—involve substantial spending for contractors. But because the projects have been part of the same contract since 1993, and because the same work may contribute to more than one analysis, agency staff said that assigning costs to a particular RIA is difficult.

(For the purposes of its study, CBO apportioned contract costs equally among the three analyses.)

RIA Costs Sometimes Reflect Related Activities. Besides the costs of actually preparing a regulatory impact analysis, the estimates in CBO's study generally include the government's cost of several other activities:

- o Collecting information;
- o Conducting an economic impact analysis, the analytical precursor to an RIA; or
- o Conducting a regulatory flexibility analysis, which examines, the impact of the rule on small entities (particularly small business), as required by the Regulatory Flexibility Act of 1980.

Information collection can be an essential precursor to cost-benefit analysis, especially for environmental regulations. Depending on the scope and complexity of the rule, EPA may have to survey hundreds of facilities to obtain the latest economic and technical information to determine the industry's cost of compliance. For example, the Office of Water issued a proposed rule applying to the pulp and paper industry, which includes some 10,000 to 15,000 facilities; EPA surveyed about 200

of them.<sup>3</sup> EPA also sometimes performs a regulatory flexibility analysis at the same time as an RIA and publishes them together. In that case, costs are reported for both, but the majority of costs usually belong to the RIA.

In addition, if an RIA is for a final rule, the cost figure may include costs for both the draft RIA (for a proposed rule) and the final RIA. Although separating draft and final analyses would be preferable, the agencies that CBO surveyed could not consistently report data at that level of detail.<sup>4</sup>

RIA Costs Sometimes Do Not Reflect Necessary Supporting Analysis. Although RIAs are economic analyses, they often depend on the results of other kinds of analysis. According to a Congressional Research Service report about environmental regulations, "quantitative environmental risk analysis . . . is a necessary prerequisite to the conduct of cost-benefit-risk assessment of environmental regulations, because the 'benefits' are the risks avoided (that is, the adverse effects on human health or the environment, or risks of such effects, that the regulation is meant to address)."<sup>5</sup> Other prerequisites for estimating costs and benefits may include environmental assessments

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3. Personal communication with Neil Patel, Chief, Economic and Statistical Analysis Branch, Environmental Protection Agency, July 1996.

4. Agencies sometimes could not distinguish between costs for the draft and final RIAs both because they did not keep the data and because in some cases the final rule changed little from the draft rule.

5. Linda-Jo Schierow, *Risk Analysis and Cost-Benefit Analysis of Environmental Regulations*, CRS Report for Congress 94-961 ENR (Congressional Research Service, December 2, 1994), p. 4.



and engineering studies. Although the results of those studies may be necessary for an RIA, they are usually not included as part of the regulatory impact analysis per se.

For example, the NHTSA generally produces an engineering study before developing a regulatory cost-benefit analysis. Engineering studies are necessary to determine the effects of new safety features, including how cars must be modified to comply with a rule (costs) and the physical safety effects of that modification (benefits). The NHTSA cannot estimate costs and benefits without that analysis, but the engineering analyses are performed by a separate office and published as separate documents. Their costs are not included in the costs of the agency's RIAs presented here.

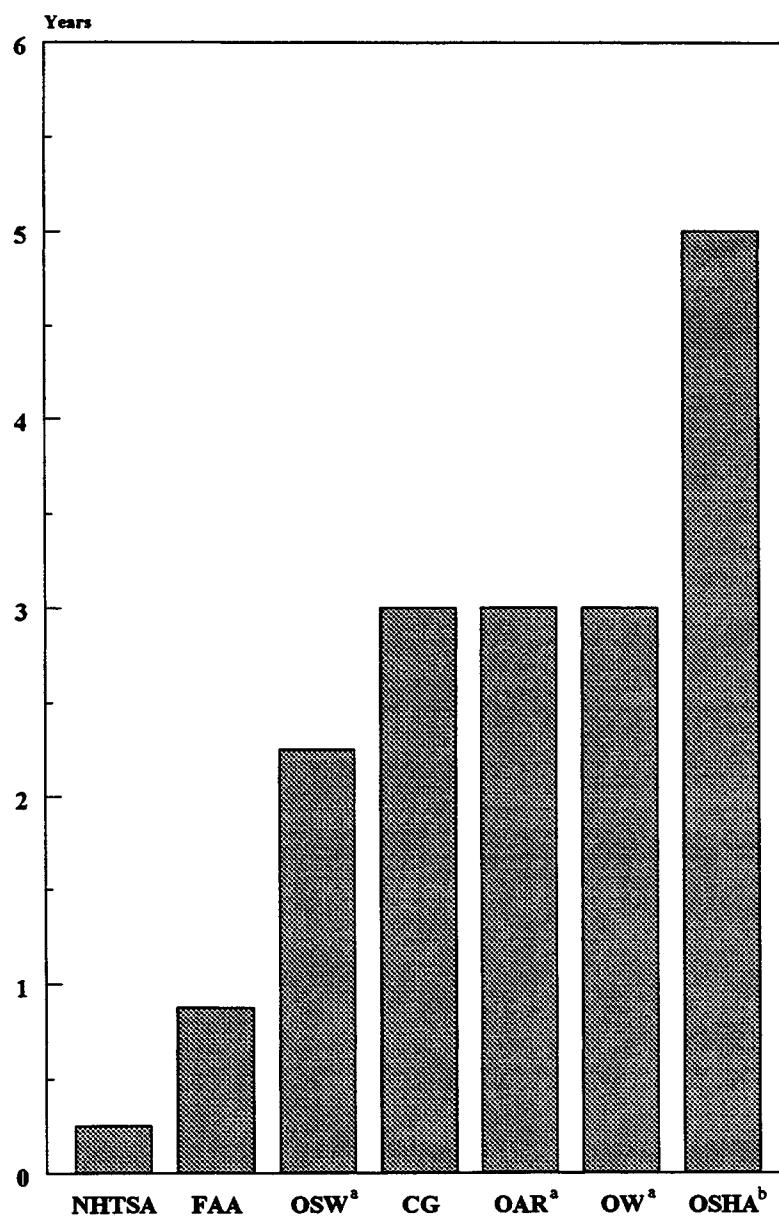
Moreover, one supporting analysis may contribute to several RIAs, so its cost may be difficult to allocate among them. For example, EPA's Office of Solid Waste is undertaking a comprehensive risk analysis (commonly referred to as the Multipathway Analysis) that will probably contribute to a number of RIAs. CBO's study did not include estimated costs for risk assessments or engineering studies; therefore, it may significantly understate the cost of conducting some RIAs.

### THE AVERAGE RIA TOOK MORE THAN TWO YEARS TO COMPLETE

The time needed to complete regulatory impact analyses varied among and within agencies just as costs did. The average time per RIA in CBO's study was 2.7 years (with a standard deviation of 1.9 years and a median of 2.25 years). The NHTSA and the FAA took the least time to complete analyses. The NHTSA's analyses required between six weeks and nine months to complete, with a median time of about three months (see Figure 7). The FAA's analyses took anywhere from seven months to one year, with a median time of 10 months.

Several factors contribute to the length of time a regulatory impact analysis requires. FAA officials cited tight deadlines for analysis as one reason that their RIAs generally take less than a year to complete. Although it is not clear why the NHTSA conducts its analyses in less than a year's time, agency officials pointed out that the information it needs to assess costs and benefits is more accessible than the information that an agency such as EPA needs. For example, the NHTSA can experiment with crash-test dummies to determine the benefits of a new safety feature, whereas EPA may have to model the probabilities of specific interactions between contaminants in soil, air, and water. The NHTSA also maintains a comprehensive accident database that it uses to estimate benefits (such as potential lives saved) from a rule. Finally, the agency pointed out that the visible benefits from its rules begin to accumulate in five to 10 years, whereas the benefits from an EPA rule—for example,

FIGURE 7. MEDIAN TIME TO COMPLETE A REGULATORY IMPACT ANALYSIS



SOURCE: Congressional Budget Office using data from the agencies cited.

NOTE: NHTSA = National Highway Traffic Safety Administration; FAA = Federal Aviation Administration; OSW = Office of Solid Waste; CG = Coast Guard; OAR = Office of Air and Radiation; OW = Office of Water; OSHA = Occupational Safety and Health Administration.

a. An office of the Environmental Protection Agency.

b. The Occupational Safety and Health Administration estimated an average time for its analyses.

prevention of new cancer cases—may begin to accrue in 30 or 40 years. Benefits that accrue later are less certain than benefits that accrue immediately and may be harder to estimate.

All other agencies reported that completion time for RIAs ranged from months to years. Coast Guard analyses took an average of three years, with a range of one to six years; OSHA estimated that it spent five years per analysis; and EPA's analyses ranged from four months to 12 years. Within EPA, of course, times varied by office. RIAs at the Office of Water took from one to seven years to finish, with an average time of 3.3 years. RIAs at the Office of Solid Waste took one to four years to complete, with an average time of 2.5 years. RIAs at the Office of Air and Radiation took an average of about three years to complete and ranged from nine months to five years—with a few exceptions.

One very long analysis in the Office of Air and Radiation involved the Onboard Vapor Fuel Recovery Rule, which took 12 years to finish and cost about \$4.4 million. The RIA for that rule was conducted mainly in-house, so its costs are relatively uncertain, for the reasons noted earlier (about 80 percent of costs were for EPA personnel). The vapor-recovery rule requires automakers to install systems to recover fuel vapors that escape near automobile gas tanks. It stems from language in section 202(a)(c) of the 1977 Clean Air Act Amendments that gave EPA the authority to regulate fuel emissions either at the gas pump or on board the car. The proposal was

unusually controversial, and the rulemaking process involved a number of parties. According to EPA officials, the process stalled while interest groups debated whether it should proceed. That disagreement, as well as substantial comments that required a response from EPA, extended the regulatory analysis.

The following sequence of events illustrates why the analysis took 12 years. Work began on the rule in 1983, and EPA published a cost-benefit analysis the next year. But extensive public comment on that analysis and on a 1987 notice of proposed rulemaking forced EPA to conduct more studies and analysis. Later, EPA halted work on the analysis pending additional guidance from the 1990 Clean Air Act Amendments, which eventually directed EPA to go forward with the rule. In 1991, the agency published a notice seeking additional comment on the rule and other changed circumstances since the 1987 notice. However, the Clean Air Act also required EPA to consult with the Department of Transportation about safety concerns; those concerns prompted EPA to publish a 1992 notice of intent not to finalize the rule. That action was overturned by the Circuit Court of the District of Columbia in April 1993, and a final rule was promulgated in January 1994. The first set of cars equipped with refueling vapor recovery systems will probably be ready for the 1998 model year.

### AGENCIES DEVOTE VARYING NUMBERS OF STAFF TO RIA WORK

The number of agency staff working on RIAs also varies tremendously. RIA work is concentrated primarily in one office at the NHTSA, the FAA, the Coast Guard, and OSHA. The NHTSA office has about six staff members and analyzes relatively few significant rules (only about one per year). The FAA has a 12-person office and also analyzes about one rule per year. The Coast Guard maintains a seven-person office. OSHA estimated that about 25 of its employees work on RIAs at any given time, although economic and risk analyses are done in separate offices. By contrast, RIA work at EPA is performed by several groups spread throughout the various offices, and CBO did not attempt to tally all of the people who ever worked on all 65 of that agency's RIAs. Clearly, some agencies need to devote more agency resources to RIAs than others.

### DETERMINING WHAT CONSTITUTES AN RIA IS DIFFICULT

Accurately determining the number of RIAs an agency conducts is difficult, for two reasons. First, multiple definitions of the term "regulatory impact analysis" are in use. Although an RIA is generally understood to mean only a cost-benefit analysis required for a significant rule, some agencies use the term to denote any analysis that considers benefits as well as costs or that considers alternatives as well as the preferred

regulatory option—regardless of the dollar level. For example, the FAA defines an RIA to include consideration of alternatives; it does not analyze alternatives for rules that are not significant.

Likewise, one of the lowest-cost RIAs reported by officials in EPA's Office of Solid Waste was termed an "economic assessment"—that is, an analysis of a rule that is not significant. Program officials considered it an RIA because it analyzed benefits as well as costs. Analyzing the rule, which proposed regulating the waste from processes to protect wood surfaces, cost an estimated \$80,000. A second lower-cost analysis was also deemed an RIA because it analyzed possible costs and benefits although the rule did not meet the dollar threshold to be significant. The estimated cost of that analysis, titled "Analysis of Potential Cost Savings and the Potential for Reduced Environmental Benefits of the Proposed Universal Waste Rule," totaled about \$100,000.

A twist on the definition problem is that an addendum to a regulatory impact analysis is also considered an RIA in and of itself, at least as reported by the agencies to CBO. One of the least costly RIAs from the Office of Water involved an addendum to a previous analysis. The addendum to the RIA for "National Primary Drinking Water Regulations for Lead and Copper" cost about \$50,000 and took less than two years to complete.

Furthermore, although a regulatory impact analysis is required for every significant rule, the lack of a one-to-one correspondence between RIAs and significant rules leads to further imprecision in the number of RIAs. For example, in 1995, EPA told the Congress that since 1981 it had issued only about 70 rules that cost society more than \$100 million annually (the definition of significant).<sup>6</sup> However, in a separate response to the Congress in 1995, EPA indicated that it had performed 250 draft and final RIAs since 1981.<sup>7</sup> Although most rules have draft and final RIAs (for the proposed rule and final rule, respectively), some RIAs may go through many more than two iterations, and others may be completed but never published (since not all proposed rules become final).

One analysis from EPA's Office of Water illustrates the difficulty of keeping track of all RIAs. That analysis, which covers the proposed underground injection of so-called class II contaminants, cost about \$500,000 (of which 10 percent was EPA personnel costs) and took about six years to complete. However, the analysis indicated that the rule would impose significant costs on society; for that and other reasons, the rule was never promulgated. Because the rule was quashed, EPA did not publish the RIA, even though the analysis had consumed significant time and effort. Not surprisingly, finding out about such unpublished but still costly RIAs is difficult.

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6. EPA response to Congressman Cardiss Collins, House Committee on Government Reform and Oversight, on H.R. 994, May 15, 1995, p. 1.

7. EPA response to Congressman George Brown, House Committee on Science, on H.R. 9, January 31, 1995, p. 7.



That case is not unique. The same office completed two other analyses in the 1992-1995 period (involving regulation of radionuclides) whose regulations were not issued because the costs they would impose on society were too high. Together, those two analyses cost about \$280,000.

